REMARKS

This paper is responsive to a non-final Office Action dated January 14, 2004. Claims 2-12, 15-25, and 27 were examined. Claims 2-6, 10, 11, 17, 18, 22, and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,369,437 to MacPherson et al. in view of U.S. Patent No. 6,674,163 to Andoh. Claims 2, 7-9, 11, 12, 15-18, 20-23, and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,536,968 to Crafts et al. in view of Andoh. Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,266,829 to Hamdy et al. in view of Andoh. Claim 21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,748,031 to Best in view of Andoh. Claims 19 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over MacPherson in view of Andoh and further in view of U.S. Patent No. 6,434,632 to Hall. Claim 25 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over MacPherson in view of Andoh and further in view of U.S. Patent No. 5,134,616 to Barth, Jr. et al.

Notice of References Cited (PTO-892)

Applicants respectfully request the Examiner to cite U.S. Patent No. 6,434,632 to Hall, referred to in the Office Action mailed October 30, 2002, and in subsequent papers, in a Notice of References Cited (PTO-892) and to send a copy of the PTO-892 to the Applicants.

Art Rejections Under 35 U.S.C. § 103(a)

Claims 2-6, 10, 11, 17, 18, 22, and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,369,437 to MacPherson et al. in view of U.S. Patent No. 6,674,163 to Andoh. Regarding claim 2, Applicants respectfully maintain that MacPherson, alone or in combination with Andoh or other references of record, fails to teach or suggest

> a package for mounting at least one integrated circuit die, the package comprising at least one one-time programmable element having a first and a second end separated by a programmable link,

as recited in claim 2. MacPherson teaches a conventional fuse array within an integrated circuit device. (Col. 4, lines 6-9) Andoh teaches a package structure for an integrated circuit device. (Abstract) The Office Action states that "[t]he package molds the chip and protects it from the outside environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a package in order to protect the integrated circuit device and have it function properly."

However, that combination fails to teach or suggest claim 2. A package is distinct from a semiconductor die inside the package. Hence, a package protecting an integrated circuit device having a conventional fuse array fails to teach or suggest a package comprising at least one one-time programmable element, as recited by claim 2. That distinction is made clear in the application. For example, the Applicants provide a definition in the specification at page 6, lines 2-10: "the term package as used herein is intended to include any integrated circuit carrier....In addition to the external connections, the package provides connections between chip 205 and package 207." The meaning of the term "package" and its distinction from the device may also be obtained from a publicly available glossary. "Dictionaries, encyclopedias and treatises, publicly available at the time the patent is issued, are objective resources that serve as reliable sources of information on the established meanings that would have been attributed to the terms of the claims by those of skill in the art." Texas Digital Sys., Inc. v. Telegenix Inc., 64 USPQ2d 1812, 1818 (Fed. Cir. 2002). In general, an integrated circuit package is "[t]he combined mounting and housing for an integrated circuit; the package protects the integrated circuit and permits external connections to be made to it." MODERN DICTIONARY OF ELECTRONICS, 381 (Rudolf F. Graf ed., Newnes 7th ed. 1999).

For the reasons given above, Applicants respectfully submit that claim 2 distinguishes over MacPherson, alone or in combination with other references of record. Accordingly, Applicants respectfully request that the rejection of claim 2 and all claims dependent thereon, be withdrawn.

Regarding claim 17, Applicants respectfully maintain that MacPherson, alone or in combination with Andoh or other references of record, fails to teach or suggest

> a package including one or more one-time programmable elements having a first and a second end separated by a programmable link,

as recited by claim 17. MacPherson teaches a conventional fuse array within an integrated circuit device. (Col. 4, lines 6-9) Andoh teaches a package structure for an integrated circuit device. (Abstract) The Office Action states that "[t]he package molds the chip and protects it from the outside environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a package in order to protect the integrated circuit device and have it function properly." However, that combination fails to teach or suggest claim 17. As discussed previously, a package is distinct from a semiconductor device inside the package. Hence a package protecting an integrated circuit device having a conventional fuse array fails to teach or suggest a package including one or more one-time programmable element, as recited by claim 17. For at least this reason, Applicants respectfully submit that claim 17 distinguishes over MacPherson, alone or in combination with other references of record. Accordingly, Applicants respectfully request that the rejection of claim 17 and all claims dependent thereon, be withdrawn.

Claims 2, 7-9, 11, 12, 15-18, 20-23, and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,536,968 to Crafts et al. in view of Andoh. Regarding claim 2, Applicants respectfully maintain that Crafts, alone or in combination with Andoh or other references of record, fails to teach or suggest

> a package for mounting at least one integrated circuit die, the package comprising at least one one-time programmable element having a first and a second end separated by a programmable link,

as recited in claim 2. Crafts teaches a programmable read only memory (PROM) including an array of polysilicon fuse elements formed within a semiconductor substrate. (Abstract) Andoh teaches a package structure for an integrated circuit device. (Abstract) The Office Action states that "[t]he package molds the chip and protects it from the outside environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include

a package in order to protect the integrated circuit device and have it function properly." However, that combination fails to teach or suggest claim 2. As mentioned previously, a package is distinct from a device protected by a package. Hence, a package protecting a PROM including an array of fuse elements fails to teach or suggest a package comprising at least one one-time programmable element, as recited by claim 2. For at least this reason, Applicants respectfully submit that claim 2 distinguishes over Crafts, alone or in combination with other references of record. Accordingly, Applicants respectfully request that the rejection of claim 2 and all claims dependent thereon, be withdrawn.

Regarding claim 12, Applicants respectfully maintain that Crafts, alone or in combination with Andoh or other references of record, fails to teach or suggest

> a package for mounting at least one integrated circuit die, the package comprising at least one one-time programmable element having a first and a second end separated by a programmable link,

as recited by claim 12. Crafts teaches a programmable read only memory (PROM) including an array of polysilicon fuse elements formed within a semiconductor substrate. (Abstract) Andoh teaches a package structure for an integrated circuit device. (Abstract) The Office Action states that "[t]he package molds the chip and protects it from the outside environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a package in order to protect the integrated circuit device and have it function properly." However, that combination fails to teach or suggest claim 12. As discussed previously, a package is distinct from a semiconductor device inside the package. Hence, a package protecting a PROM including an array of fuse elements fails to teach or suggest a package comprising at least one one-time programmable element, as recited by claim 12. For at least this reason, Applicants respectfully submit that claim 12 distinguishes over Crafts, alone or in combination with other references of record. Accordingly, Applicants respectfully request that the rejection of claim 12 and all claims dependent thereon, be withdrawn.

Regarding claim 17, Applicants respectfully maintain that Crafts, alone or in combination with Andoh or other references of record, fails to teach or suggest

> a package including one or more one-time programmable elements having a first and a second end separated by a programmable link,

as recited by claim 17. Crafts teaches a programmable read only memory (PROM) including an array of polysilicon fuse elements formed within a semiconductor substrate. (Abstract) Andoh teaches a package structure for an integrated circuit device. (Abstract) The Office Action states that "[t]he package molds the chip and protects it from the outside environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a package in order to protect the integrated circuit device and have it function properly." However, that combination fails to teach or suggest claim 17. As mentioned previously, a package is distinct from a device protected by a package. Hence, a package protecting a PROM including an array of fuse elements fails to teach or suggest a package including one or more one-time programmable elements, as recited by claim 17. For at least this reason, Applicants respectfully submit that claim 17 distinguishes over Crafts, alone or in combination with other references of record. Accordingly, Applicants respectfully request that the rejection of claim 17 and all claims dependent thereon, be withdrawn.

Regarding claim 21, Applicants respectfully maintain that Crafts, alone or in combination with Andoh or other references of record, fails to teach or suggest

> a package including one or more one-time programmable elements having a first and a second end separated by a programmable link,

as recited in claim 21. Crafts teaches a programmable read only memory (PROM) including an array of polysilicon fuse elements formed within a semiconductor substrate. (Abstract) Andoh teaches a package structure for an integrated circuit device. (Abstract) The Office Action states that "[t]he package molds the chip and protects it from the outside environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a package in order to protect the integrated circuit device and have it function properly." However, that combination fails to teach or suggest claim 21. As discussed previously, a package is distinct from a semiconductor device inside the package. Hence, a package protecting

a PROM including an array of fuse elements fails to teach or suggest a package including one or more one-time programmable element, as recited by claim 21. For at least this reason, Applicants respectfully submit that claim 21 distinguishes over Crafts, alone or in combination with other references of record. Accordingly, Applicants respectfully request that the rejection of claim 21 and all claims dependent thereon, be withdrawn.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,266,829 to Hamdy et al. in view of Andoh. Applicants respectfully maintain that Hamdy, alone or in combination with Andoh or other references of record, fails to teach or suggest

> a package for mounting at least one integrated circuit die, the package comprising at least one one-time programmable element having a first and a second end separated by a programmable link, wherein the first end of the one-time programmable element is coupled to a power supply voltage node in the package and wherein the package further comprises another programmable element serially coupled between the second end of the programmable element and an external package connection,

as recited by claim 12. Hamdy teaches that anti-fuses may be formed as a diffusion region in a semiconductor substrate. (Abstract) At col. 3, lines 48-50, Hamdy teaches that "[t]he anti-fuses may be blown either before or after packaging of the integrated circuit die." The semiconductor integrated circuit of Hamdy is distinct from the package. Therefore, Hamdy fails to teach a package for mounting an integrated circuit die comprising at least one one-time programmable element having a first and a second end separated by a programmable link, wherein the first end of the one-time programmable element is coupled to a power supply voltage node in the package and wherein the package further comprises another programmable element serially coupled between the second end of the programmable element and an external package connection.

Claim 12 further recites that another programmable element is serially coupled between the second end of the programmable element and an external package connection. That structure

is shown, for example, in Fig. 8 where programmable elements 624-627 are coupled between the second end of programmable element 601-607 and external package connectors. The structure illustrated in Fig. 8 provides, as described on page 10, lines 3-7 of the application, that the fuses 624-627 can be used in testing environments, where, for example, an internal signal must be accessible during test, but is then decoupled from the package pin by blowing a fuse prior to product shipment. That claimed structure and the advantage referenced above is not taught or suggested in any of the references of record alone or in combination.

Hamdy is directed towards electrically programmable interconnect devices for use in integrated circuits. Hamdy fails to teach anything related to one time programmable elements on packages. The Office Action points to elements 168d in Fig. 5a of Hamdy and asserts that element 168h is coupled between a second end of anti-fuse 168d and output 178. According to the Office Action, the first end of anti-fuse 168d is coupled to bit line 00 (the power supply). The Applicants note that the second end of anti-fuse 168d is coupled either to ground through transistor 168d or is floating if the anti-fuse is not programmed. Thus, the element 168h cannot be coupled between the second end as required by the claim and an external package connection.

Andoh fails to compensate for the shortcomings of Hamdy. Andoh teaches a package structure for an integrated circuit device. (Abstract) Andoh includes no discussion of fuses. The Office Action states that "[t]he package molds the chip and protects it from the outside environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a package in order to protect the integrated circuit device and have it function properly." However, that combination fails to teach or suggest claim 12. As mentioned previously, a package is distinct from a device protected by a package. Hence, a package protecting a PROM including an array of fuse elements fails to teach or suggest a package comprising at least one one-time programmable element, as recited by claim 12. For at least this reason, Applicants respectfully submit that claim 12 distinguishes over Hamdy, alone or in combination with other references of record. Accordingly, Applicants respectfully request that the rejection of claim 12 and all claims dependent thereon, be withdrawn.

Claim 21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,748,031 to Best in view of Andoh. Best teaches fuses in an integrated circuit. (Abstract)

Andoh teaches a package structure for an integrated circuit device. (Abstract) Andoh includes no discussion of fuses. The Office Action states that "[t]he package molds the chip and protects it from the outside environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a package in order to protect the integrated circuit device and have it function properly." However, that combination fails to teach or suggest claim 21. As mentioned previously, a package is distinct from a device protected by a package. Hence, a package protecting a PROM including an array of fuse elements fails to teach or suggest a package comprising at least one one-time programmable element, as recited by claim 21. For at least this reason, Applicants respectfully submit that claim 21 distinguishes over Best, alone or in combination with other references of record. Accordingly, Applicants respectfully request that the rejection of claim 21 and all claims dependent thereon, be withdrawn.

Claims 19 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over MacPherson in view of Andoh and further in view of U.S. Patent No. 6,434,632 to Hall. Claims 19 and 24 depend from allowable claims and are allowable for at least this reason. Accordingly, Applicants respectfully request that the rejection of claims 19 and 24 and all claims dependent thereon, be withdrawn.

Claim 25 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over MacPherson in view of Andoh and further in view of U.S. Patent No. 5,134,616 to Barth, Jr. et al. Applicants respectfully maintain that MacPherson, alone or in combination with Andoh, Barth, and/or other references of record, fails to teach or suggest

> at least one integrated circuit die mounted in the package and wherein a state of the programmable element specifies use of error correction code (ECC) for a cache memory on the integrated circuit,

as recited by claim 25. The Office action rejects claim 25 relying on MacPherson and Barth, col. 12, lines 10-34, to teach a semiconductor memory device wherein fuses are programmed to perform an error correction. However, that combination fails to teach that the claimed programmable element specifies use of ECC for the cache memory on the integrated circuit as

claimed in claim 25. Instead, Barth teaches using fuses to achieve redundancy by efficiently switching in redundant bit lines. See Summary of the Invention. Barth fails to teach or suggest specifying use of ECC using a programmable element as claimed in claim 25. Andoh fails to compensate for the shortcomings of MacPherson and Barth. Andoh teaches a package structure for an integrated circuit device. (Abstract) Andoh includes no discussion of ECC. Accordingly, Applicants respectfully submit that claim 25 distinguishes over the references of record and request that the rejection of claim 25 and all claims dependent thereon be withdrawn.

In summary, claims 2-12, 15-25, and 27 are in the case. All claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.

No fee is believed due with this paper. However, if any fee is determined to be required, the Office is authorized to charge Deposit Account 50-0631 for any such required fee.

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Nicole T. Cave — 4/14/04 (Date)

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